

**Engaging audiences through social media in colleges of agricultural and environmental sciences**

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## **Abstract**

Seventy percent of Americans use social media to connect with one another, share information and entertain themselves (Pew, 2019). Of those connecting socially, it's estimated 79% of 18-29-year olds are using Facebook and 38% are using Twitter. With college students being active on social media, college departments are able to leverage these many platforms to engage with students meaningfully. What is not clear, is what are the most successful tactics these departments are using.

The objectives of this study were to 1) understand how departments within a college of agriculture and natural resources use Twitter and Facebook to engage audiences, 2) determine the success of tactics based on the highest levels of engagement, and 3) understand whom popular posts are targeting.

For this study, researchers gathered 16 months of analytical information from 4 academic departments. The top 5 Twitter posts from each month per department were used to determine the average number of impressions, engagements, and the overall engagement. For Facebook, the lifetime of a post's total reach and lifetime of engaged users were averaged. Tactics noted included if the post had a photo, video, link, hashtag, or tagged another page. The audience of each post was analyzed to track popular themes.

For Twitter, 307 tweets were analyzed across 4 departments. The departments had 608 total engaging elements, while on Facebook, 303 posts were analyzed for 493 total engaging elements across departments. Results show departments are engaging with three main audiences: students, faculty/staff, and alumni. Posts with engaging elements of images and videos had higher levels of user engagement in all departments. Popular themes across platforms include students on campus, student organizations, research, and events. This study aligned with most previous social media research in that posts with engaging elements have more reach. It is important that departments continue to use such tactics to reach audiences.

## **Introduction**

In 2005, when the Pew Research Center started tracking social media adoption, 5% of American adults used at least one social media platform. This rose to nearly half of Americans by 2011, and now over 70% of Americans are using social media to connect with others, engage with news content, share information, and find entertainment (Pew, 2019).

The age group leading the way are those who are recently or currently in higher education. It is estimated that 90% of 18-29-year-olds use at least one social media site regularly. According to Pew Research, 80% of college graduates and 74% of individuals with some college use at least one social media site. More specifically, it has been found that 79% of 18-29-year-olds are using Facebook and 38% are using Twitter (Pew, 2019).

Facebook has a multitude of engaging elements for users to connect with their friends, family, and organizations. It uses personal pages, instant messages, wall posts, news feeds, event hosting, picture uploading, networks, and friends (Heiberger, Harper, 2008). The network and friends' features allow users to pick and choose the content they want to see based on school affiliation, region, and friends. Facebook has taken the world by storm, surpassing photo sites with the number of photos stored on their site. Facebook is available in over 15 languages, allowing the site to be accessed across the globe. More than 50% of users log in daily, and the majority view more than 50 pages a day. The events application in Facebook hosts three times the invitations of event-based websites (Heiberger, Harper, 2008). Facebook along with other platforms allow students to form and maintain relationships with people while also giving others a vast channel to reach out to this demographic (as cited by Junco, 2011).

Twitter is used for real-time information and to document the day's events. Throughout the day many voices discuss, debate, and share their views on a multitude of topics. Everyone

from news anchors, media personalities, politicians, and the public use Twitter to share their views. According to Pew Research, Twitter users are most likely to be younger, identify as Democrats, and be more educated. More than 40% of U.S. adult college graduates are using Twitter, with 54% of high school graduates are using the platform (Hughes, Wojik, 2019).

Social media platforms provide a powerful outlet for organizations to develop brand awareness, have conversations, and tell stories to audiences in an engaging way (Macnamara and Zerfass, 2012). As college students are active on social media, college departments are able to leverage platforms to engage with students in meaningful ways. What is not clear, is what is the most successful tactic these departments are using.

This study is designed to determine how the departments in one Midwestern college of agricultural and environmental sciences are engaging with students and to identify the specific tactics they are using. While social media platforms use certain algorithms, that are continually changing, and age groups interact and engage differently with the tools, researchers wanted to investigate if the type of post used had influence on the engagement rate departments see from their audiences.

### **Conceptual Framework:**

Social media can foster connections between users allowing them to generate content, share content, and engage in interactive communication (Boyd and Ellison, 2007; McFarland and Ployhard, 2015). Higher education can benefit from using social media to interact with students and influence potential applicants (Carpentier, Hoye, Weng, 2019). Although, confusion exists and universities are unsure how to manage social media campaigns and many have unclear strategies, which can hinder their potential to create relationships with students and connect with audiences (as cited by Rutter, Roper, Lettice, 2016).

The theory of Uses and Gratifications (UG) guides us in understanding how people have motivations and expectations for using certain media (as cited by Carpentier, Hoye, Weng, 2019). It has been found through studies employing UG that social media fulfills individuals' cognitive needs, such as learning about the place they go to school (as cited by Carpentier, Hoye, Weng, 2019). The theory focuses on how people are goal directed when choosing communication media and not being passive receivers of communication.

There are two types of gratification that are used to understand the motive behind social media: utilitarian gratification and social gratifications. Utilitarian gratification refers to the use of social media to gather information and learn about different topics. Social gratification refers to using social media to interact and connect with people (as cited by Carpentier, Hoye, Weng, 2019). A user's reason for using social media may influence how effective they view a social media page. For those using social media with the intent of obtaining information, they may be satisfied when they find a page with information. However, for those who are using social media with the goal to make social connections, they will find a page most effective if it provides a personal feeling. It is important to have content that will connect with both, users who are looking for information and users who are using social media for a social connection (Carpentier, Hoye, Weng, 2019).

The importance of these two gratifications was seen in one study where the main reason college students used Myspace and Facebook was to keep in touch with friends, learn about events, and share information. Social media is used to fulfil socio-psychological needs like showing affection and fulfilling cognitive needs. Social media can fulfill an individuals' cognitive needs, for example the media could play a role in learning about the place they go to school (as cited by Carpentier, Hoye, Weng, 2019).

As students look to collect information about the place they go to school, they want this information to be easily accessible and up to date. Informativeness, a characteristic related to utilitarian gratification and social gratifications, is the amount of relevant, useful, and adequate information provided for people (as cited by Carpentier, Hoye, Weng, 2019). Social media is an outlet for people to use to gather information and should be a motive for users. The type of information provided on an organization or department's page may influence the views and attitudes a user has about that particular organization or department (as cited by Carpentier, Hoye, Weng, 2019).

## **Methods**

The objectives of this study were to 1) understand how the departments within a college of agriculture and natural resources use the social media platforms of Twitter and Facebook to engage their audiences 2) determine the success of tactics used and determine which have the highest level of engagement, and 3) understand whom popular theme posts are targeting.

For this study, the researcher gathered social media analytic information from the platforms of Facebook and Twitter from January 2018 to April 2019 from four departments within the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. The top five posts from each month – January 2018 – April 2019 were gathered in a spreadsheet document where the researcher organized the information. For Twitter the data collected included: Date, link to the original post, text from tweet, impressions (total number of times the tweet has been seen), engagements (total number of times a user interacted with a tweet, including clicks on tweet, retweets, replies, follows, likes, links, hashtags, username, profile, etc.), engagement rate (number of engagements divided by impressions), retweets, likes,

user profile clicks (clicks on the name, @username, or profile photo of the individual who tweeted), URL clicks (clicks on the links in the tweet), media engagements (clicks on the photo or video in the tweet), photo/video, link, hashtag, tags to other pages or people, targets/audience. For Facebook the data collected included: Date, link to the original post, text from post, type, lifetime post total reach (the number of unique users who saw your post), lifetime engaged users (number of users who engaged with the post), photo/video, link hashtag, tags to other pages or people, targets/audience.

These top five posts for each month were then sorted to show the posts with the highest number of impressions for Twitter and reach for Facebook. For each departments' Twitter impressions, engagements, engagement rate, retweets, likes, user profile clicks, URL clicks, and media engagements were averaged. For Facebook lifetime post total reach and lifetime engaged users were averaged.

For each of the top five posts from January 2018 – April 2019 the researcher tallied if the post had a photo/video, a link, a hashtag, or tagged another page. These were recorded as the engaging elements used. The researcher also marked what the topic of the post was such as, student, faculty, alumni, student organization, event, etc. These topics were used to determine the audience of each post and to analyze popular themes. The top five overall posts from this document were also recorded with their analytic information.

## **Results**

*Objective 1: Understand how the departments within a college of agriculture and natural resources use the social media platforms of Twitter and Facebook to engage their audiences*

Findings showed that departments engage with their audiences through photo/videos, links, hashtags, or by tagging another page. On Twitter, 307 tweets were analyzed across the 4

departments. It was found that departments had 608 total engaging elements on these posts. There were 211 total photos/videos, 112 total external links, 160 hashtags, and 125 tags to other pages or people used across departments. Department 1 had the most engaging elements at 199, followed by Department 3 with 177 and Department 2 with 119 total engaging elements (see table 1).

*Table 1. Average engaging elements per department for Twitter.*

Department	Total Photo/video	Total Link	Total Hashtag	Total Tags	Total engaging elements
1	71	24	69	35	199
2	56	22	33	8	119
3	52	35	42	48	177
4	32	31	16	34	113

On Facebook, 303 posts were analyzed for a total of 493 engaging elements across departments. A total of 153 total photos/videos, 166 links, 89 hashtags, and 85 tags were used. Department 1 had the highest number of engaging elements at 211 followed by department 3 with 104 elements and department 2 with 100. Department 4 was last with 78 total engaging elements. A complete breakdown of each engaging element is presented in table 2. Twitter had 115 more engaging elements than Facebook. Department 2 and department 4 did not use any hashtags on Facebook where they had used 33 and 16 on Twitter.

*Table 2: Average engaging elements per department for Facebook.*

Department	Total Photo/video	Total Link	Total Hashtag	Total Tags	Total engaging elements
1	34	47	68	62	211
2	57	31	0	12	100
3	29	47	21	7	104
4	33	41	0	4	78



The top five posts based on impressions for Twitter and reach for Facebook from the January 2018 – April 2019 range were also tallied for engaging elements. On Twitter there were a total of 36 engaging elements used in the top 5 posts. Department 1 used 1 photo/video, 1 hashtag, and 1 tag for their post with the highest engagement level (see table 3).

*Table 3: Breakdown of top 5 posts' engagement elements by department for Twitter.*

Department	Tweet	Photo/video	Link	Hashtag	Tags	Total engaging elements
1	1	1		1	1	3
	2			1		1
	3	1	1	1	1	4
	4	1		1		2
	5	1		1	1	3
2	1	1				1
	2	1				1
	3	1		1		2
	4	1				1
	5	1				1
3	1	1		1		2
	2		1	1		2
	3	1		1		2
	4	1	1			2
	5	1	1	1		3
4	1		1			1
	2		1			1
	3		1			1
	4		1			1
	5	1			1	2

On Facebook there were a total of 35 engaging elements used in the top 5 posts.

Department 1 used 2 engaging elements – 1 photo/video and 1 tag for their post with the highest reach. The post with the highest reach for department 2 had 1 photo/video while department 3's post that had the highest reach used 1 photo/video and 1 link. Department 4 targeted faculty and students with their highest reach post and used 1 link.

*Table 4: Engaging elements for the top 5 posts by department for Facebook.*

Department	Tweet	Photo/video	Link	Hashtag	Tags	Total engaging elements
1	1	1			1	2
	2	1		1	1	3
	3	1		1	1	3
	4	1		1	1	3
	5	1			1	3
2	1	1				1
	2	1				1
	3	1				1
	4	1				1
	5	1			1	2
3	1	1	1			2
	2		1	1		2
	3	1		1		2
	4	1	1			2
	5	1				1
4	1		1			1
	2		1			1
	3		1			1
	4		1			1
	5	1			1	2

*Objective 2: Determine the success of tactics used and determine which have the highest level of engagement*

For Twitter, 307 tweets were analyzed across 4 departments. Department 1 had 80 total tweets with an average impression rate of 1,801.7. The department had an average of 88.04 engagements and an average engagement rate of .053. The average number of retweets for the posts was 3 and the average number of likes was 14. Data showed that the user profile was clicked an average of 3.5 times, URL click average of 2.36, and 53.5 average media engagements (see table 5).

Department 2 had 79 total tweets with an average impression rate of 1,098.38. There were 51.41 average engagements and an average engagement rate of .044, average number of retweets of 3, and an average number of 8 likes.

Department 3 had 80 total tweets with an average impression rate of 2,878.53 and 77 average engagements. The average engagement rate was .031, and the data also showed an average number of 4 retweets, 12 likes was 12, and 5.1 profile clicks.

Department 4 had 68 total tweets with an average impression rate of 1,097.43 and 13.71 average engagements. The data showed an average engagement rate of .018, and average number of 1 retweet. There was an average number of 3 likes and .88 user profile clicks.

*Table 5: Average analytic findings and engagement elements on Twitter platform by department*

Department & total number of tweets.	Average Impressions	Average Engagements	Average Engagement rate	Retweets	Likes	User Profile Clicks	URL Clicks	Media Engagements
1 – 80	1801.7	88.04	0.053	3	14	3.58	2.36	53.475
2 – 79	1098.38	51.41	0.044	3	8	2.3	3.8	29.354
3 – 80	2878.54	77.00	0.031	4	12	5.14	6.8	38.025
4 – 68	1097.43	13.71	0.018	.88	3	.88	1.97	3.029

On Facebook, 303 posts were analyzed for 493 total engaging elements across departments. Department 1 had the highest number of engaging elements at 211, the highest post total reach at 2,946, and the highest engaged users at 338 with a total of 80 total posts.

The average lifetime post total reach was 2, 946 with the average lifetime engaged users being 338 for department 1. Department 2 had 76 total posts and average lifetime post total reach was 1,701. The average lifetime engaged users was 253. Department 3 had 67 total posts. The average lifetime post total reach was 416 with the average lifetime engaged users being 36. Department 4 had 80 total posts with an average lifetime post total reach of 382. The average lifetime engaged users being 18 (see table 6).

*Table 6: Average analytic findings and engagement elements on Facebook platform.*

Department and Total Posts	Average Lifetime Post Total Reach	Average Lifetime Engaged Users
1 – 80	2946	338
2 – 76	1701	253
3 – 67	416	36
4 – 80	382	18

The top five posts from the January 2018 – April 2019 range were tallied for highest number of impressions and engagement levels. The tweet with the highest number of impressions for department 1 was about a student organization and received 13, 848 impressions, 105 engagements, .0076 engagement rate, 7 retweets, 9 likes, and 2 user profile views (see table 7).

*Table7: Analytic findings from the Top 5 posts for department 1 on Twitter.*

Tweet & Audience	Impression	Engagement	Engagement rate	Retweet	Likes	User Profile Clicks	URL Clicks	Media Engagement
1. Students	13,848	105	0.0076	7	9	2	10	68
2. Students	7,738	18	0.0038	3	10	3	1	0
3. Students	3,956	194	0.049	9	19	4	6	145
4. Students	3,763	70	0.0186	6	37	1	1	0
5. Faculty	3,462	335	.0968	7	46	8	1	248

Department 2's tweet highest number of impressions was 3, 082. There were 162 engagements, with an engagement rate of .052, 7 retweets, 32 likes, 5 user profile views, and 96 media engagements (see table 8).

*Table 8: Analytic findings from the Top 5 posts for department 2 on Twitter.*

Tweet & Audience	Impression	Engagement	Engagement rate	Retweet	Likes	User Profile Clicks	URL Clicks	Media Engagements
1. Faculty	3,082	162	0.0525	7	32	5	0	96
2. Students	3,069	166	0.054	6	23	3	1	105
3. Students	2,717	173	0.064	5	25	10	3	108
4. Students	2,573	205	0.0796	4	13	7	6	162
5. Faculty	2,159	207	.0958	7	31	7	14	133

Department 3's top tweet targeted students and alumni and had 21, 984 impressions. The tweet had 336 engagements, an engagement rate of .015, 6 retweets, 27 likes, 17 user profile clicks, URL clicks, and 248 media engagements (see table 9).

*Table 9: Analytic findings from the Top 5 posts for department 3 on Twitter.*

Tweet & Audience	Impressions	Engagements	Engagement rate	Retweets	Likes	User Profile Clicks	URL Clicks	Media Engagements
1. Students/ alumni	21,984	336	0.015	6	27	17	1	248
2. Event	17,275	30	0.0017	4	5	2	1	0
3. Faculty	9,494	107	0.011	5	17	13	7	26
4. Students	8,996	196	0.0218	25	36	14	48	36
5. Event	7,135	473	.0662	29	64	25	24	304

For department 4 their tweet with the highest impressions, which was 5, 927, targeted an event for faculty and students. It had 44 engagements, an engagement rate of .007, 0 retweets, 7 likes, 0 user profile views, 5 URL clicks, and 6 media engagements (see table 10).

*Table 10: Analytic findings from the Top 5 posts for department 4 on Twitter.*

Tweet & Audience	Impressions	Engagements	Engagement rate	Retweets	Likes	User Profile Clicks	URL Clicks	Media Engagements
1. Event	5,927	44	0.0525	0	7	0	5	6
2. Faculty	5,670	9	0.054	0	3	0	1	5
3. Faculty	5,500	4	0.064	0	0	0	1	1
4. Faculty	5,455	1	0.0796	0	1	0	0	0
5. Student	5,417	5	.0958	0	0	0	5	0



The top five posts from the January 2018 – April 2019 range were tallied for highest lifetime post total reach and lifetime engaged users. The Facebook post with the highest reach was targeting students and had a lifetime post total reach of 13, 861 and 1,480 lifetime engaged users (table 11).

*Table 11: Analytic findings from the Top 5 posts for department 1 on Facebook.*

Post and Audience	Lifetime Post Total Reach	Lifetime Engaged Users
1. Students	13,861	1,480
2. Students	10,772	693
3. Students	9,565	792
4. Students	8,158	1,341
5. Faculty	7,901	964

Department 2's top post had a lifetime post total reach of 6,005 and had 950 lifetime engaged users. The top post was posted for faculty members (table 12).

*Table 12: Analytic findings from the Top 5 posts for department 2 on Facebook.*

Tweet and Audience	Lifetime Post Total Reach	Lifetime Engaged Users
1. Faculty	6,005	950
2. Student	4,913	1,061
3. Student	4,880	843
4. Student	4,626	567
5. Student	4,505	682

Department 3 had their top 5 highest posts focused on students. The highest post had a lifetime post total reach of 3,355 and had 207 lifetime engaged users (table 13).

*Table 13: Analytic findings from the Top 5 posts for department 3 on Facebook.*

Tweet and Audience	Lifetime Post Total Reach	Lifetime Engaged Users
1. Student	3,355	207
2. Students	3,150	248
3. Students	2,963	315
4. Students	1,249	208
5. Students	1,159	33

Department 4 had a lifetime post total reach of 1,550 for their top post. Their top post had 27 engaged users (table 14). This was the lowest lifetime post total reach and lifetime engaged users of the 4 departments top 5 posts.

*Table 14: Analytic findings from the Top 5 posts for department 4 on Facebook.*

Tweet and Audience	Lifetime Post Total Reach	Lifetime Engaged Users
1. Event	1,550	27
2. Faculty	1,378	46
3. Faculty	972	57
4. Faculty	795	39
5. Student	693	142

### *Objective 3: Understand whom popular theme posts are targeting*

The results show that all departments are engaging with three main audiences on these platforms: students, faculty/staff, and alumni. Other popular themes found across the platforms for the top 5 highest impressions and reach posts for the departments were: students on campus, student organizations, research, and events.

### **Conclusion**

There appears to be a positive relationship between the number of engaging elements, such as photos or videos, links, hashtags, or tags, and the engagement level the posts received across Twitter and Facebook. When the departments are posting on social media, using these engaging elements could encourage more engagement among their audiences. Posts often also have an impact on the engagement levels as seen where department 1 had the most posts on Twitter and Facebook and had higher levels of engagement. Twitter overall had more impressions than Facebook although this may be linked to the fact that engagement elements were used more on Twitter than Facebook. This could be tied to the different uses Facebook and Twitter have. Facebook has the network and friends' features, which allow users to pick and choose the content they want to see based on school affiliation, region, and friends (Heiberger, Harper, 2008). Where Twitter is used for real-time information and a range of people are documenting the day's events and sharing their views (Hughes, Wojik, 2019). People use these platforms differently based on their cognitive needs, which could impact which content they would like to see, which would then impact the impressions and reach of the posts.

These departments are targeting students, faculty/staff and alumni, which provide information to these groups. The departments are fulfilling the motivations people have through using social media such as using social media to gather information and using social media to

interact and connect with people. Social media fulfills cognitive needs of individuals, such as learning about their school (as cited by Carpentier, Hoyer, Weng, 2019). These audiences are using social media to gather information and interact and connect with people, as stated through the Utilitarian gratification and social gratifications theories (as cited by Carpentier, Hoyer, Weng, 2019). Students may use these social media pages to learn more about the department and to connect with fellow classmates. Faculty and staff may use this to learn about research and to learn about event opportunities. Alumni may learn what is happening at the school they graduated from and to connect with current students and share their college experiences.

People look to these department social media platforms to learn about the department and connect with those associated with the department. People who are following these pages develop views about this page based on the information they are able to see. The information available fills the needs of users such as providing information about events on campus, what current students are doing, and the research being conducted at the land-grant institution. It also provides social content where users can interact and connect with those at the school and in the department.

Departments may also consider more direct posts for the audience of prospective students. Students may be using these pages to learn more about where they could go to school and connect with other prospective students. Prospective students may make decisions based on a program and area of study based on the information available on the social media page. Also, by continuing to post about current students, these prospective students will be able to learn about current life on campus and make decisions about their future school based on those posts.

## **Implications/Recommendations**

This study followed with most social media research in that posts with engaging elements have more reach (Ashley, Tuten, 2014). Further study may be able to determine if there is a statistically significant positive correlation between posts with engaging elements and the post with the highest levels of impressions and reach. An interesting point for further study would be to analyze if time of posting impacts the engagement levels as well.

It is suggested to teach students who are going to be posting on social media the influence engaging elements can have on engagement and reach. Students may look at learning how to develop creative content for social media accounts. It would also be suggested to teach students the different uses the social media platforms have and how to create content based on users needs. As students understand why people use social media, they will be able to craft social media posts to fulfil these gratifications.

Future research may also incorporate talking to audiences and asking their views on social media. This would be a way to ask what needs individuals expect social media to fulfill. It may also be interesting to discuss why they use social media and how to use this to gain knowledge or connect with people, or both.

Departments should consider using these engaging elements to engage with their tweets and posts. Departments should also consider how their posts are allowing their targeted audiences to gain information and also make social connections through the posts. This way these posts are fulfilling the cognitive needs of the individuals engaging with the platforms.

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